

Antioxidants delay clinical signs and systemic effects of ENU induced brain tumors in rats.

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Abstract

According to our previous study suggesting that antioxidant properties of phytochemicals in the diet decrease glioma aggressiveness, we used a SUVIMAX-like diet ("Supplémentation en Vitamines et Minéraux AntioXydants") (enriched with alpha-tocopherol, beta carotene, vitamin C, zinc, and sodium selenite), adapted to rats. The present results showed that each of the antioxidants inhibited growth of glioma cells in vitro. When used in combination for in vivo studies, we showed a highly significant delay in the clinical signs of the disease, but not a statistical significant difference in the incidence of glioma in an Ethyl-nitrosourea (ENU)-model. The SUVIMAX-like diet decreased candidate markers of tumoral aggressiveness and gliomagenesis progression. The mRNA expressions of 2 common markers in human glioma: Mn-SOD (Manganese Superoxide Dismutase) and IGFBP5 (insulin growth factor binding protein) were reduced in the tumors of rats fed the antioxidant diet. In addition, the transcripts of two markers linked to brain tumor proliferation, PDGFRb (platelet-derived growth factor receptor beta) and Ki-67, were also significantly decreased. On the whole, our results suggest a protective role for antioxidants to limit aggressiveness and to some extent, progression of gliomas, in a rat model.